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November, 1930

Psychological Bulletin

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THE
PSYCHOLOGICAL BULLETIN

TENTH MEETING OF THE WESTERN PSYCHOLOGICAL
ASSOCIATION, JUNE 13 AND 14, 1930

Report of the Secretary, PAUL R. FARNSWORTH, Stanford University

Three of the sessions of the Western Psychological Association were held at the University of Southern California. The fourth was held on the new campus of the University of California at Los Angeles. Approximately one hundred fifty were present. The address of the retiring president, J. E. Coover, was entitled "Is Psychology a Science?"

The following officers for the year 1930-31 were elected: Stevenson Smith, University of Washington, President; George H. Mount, University of Southern California, Vice-President; and Paul R. Farnsworth, Stanford University, Secretary-Treasurer.

The 1931 meeting will be held at the University of Oregon, probably the latter part of June.

The Emotionality of Sixty Infants During the First Year of Life as Evidenced by Their Crying in a Given Situation. NANCY BAYLEY,
Institute of Child Welfare, University of California.

Sixty babies were observed once each month for a sixty-minute period, during which mental and motor tests, anthropometric measurements and photographs were made. A record was kept of the amount of crying and the situations under which crying occurred. Also the nature and cause of the crying, its intensity and continuity were judged by the experimenters.

With this material comparisons have been made between different ages to determine the influence of age on the amount, intensity and causes of crying. Correlations have been computed to determine the consistency in the form and amount of crying in the course of routine laboratory experiments.

Psychology in Medical Education. J. W. BRIDGES, McGill University.

This paper deals with the relation of psychology to the other medical subjects, its place in the medical curriculum, and the content of a course for medical students. It is held that psychology belongs with the basic medical sciences rather than with the clinical subjects. Hence, instruction in the science is a task of the psychologist, while training in its application is the duty of the clinical instructor, just as in the case of anatomy, physiology and pathology. This presupposes that the clinical instructor is as conversant with psychology as with the other medical sciences.

Psychology is more difficult than anatomy or physiology because its subject matter is more complex. It should therefore follow these subjects in the medical curriculum. It will thus become more comprehensible to the student, more relevant to his other studies, and more effective in his clinical experience. Psychology should of course precede psychiatry as well as other clinical subjects.

The course should include a consideration of both normal and abnormal behavior and consciousness; and the psychological facts and theories should be linked as closely as possible with those of physiology. Moreover, the standpoint should be broad and eclectic, for the truth is more likely to be found in a reconciliation of views than in the prejudiced opinions of extremists. The main object of the course is to give the student a point of view, an understanding of the fundamental problems, and some knowledge of the well-established facts and principles of psychology.

Some Observations on the Social Development of Pre-School Children. K. M. BANHAM BRIDGES, McGill University.

Social development may be said to consist in the gradual development of more and more adequate and socially acceptable responses to social situations.

A three-year study of the social behavior of nursery school children revealed certain roughly defined stages in preschool social development.

There are seven or eight stages in group cohesion and group play noticeable between the ages of two and five years. There are three or four stages in personal contact with other children, three stages in altruism or other-mindedness, and three stages in the socialization of language.

During this same period there are also four distinct phases of

development in a child's relations with the adult. These are: dependence under two years of age, growing independence between two and two and a half years, negativism from two and a half to three and a half years, and co-operative independence over four years of age.

An Experimental Study of the Relation of Physical Resemblance to Mental Resemblance in Sibling Pairs. BARBARA S. BURKS, Stanford University, and RUTH SHERMAN TOLMAN, Occidental.

The problem is to ascertain whether or not siblings whose heredity appears to be unusually similar by the criterion of physical resemblance are more alike in mental endowment than siblings whose physical resemblance is slight. The sibling groups compared were selected from the Pasadena public schools on the basis of physical resemblance rated upon a 9-point rating scale. Independent ratings assigned to unselected pairs by the two experimenters agreed to the extent of a correlation of .67.

In grades 7 to 12, 84 pairs of siblings were tested upon the Terman Group Test. The I.Q.'s of the siblings who rated in the top half for physical resemblance gave a correlation of .67, those of the remaining siblings a correlation of .61. These correlations approximate those reported by Thorndike for group tests of siblings attending high school. The Stanford-Binet I.Q.'s of a group of 34 pairs of siblings between ages five and thirteen inclusive, whose physical resemblance was very strong, gave a correlation of .45. This correlation is close to those reported in studies of elementary school siblings tested on individual tests. Thus no association between general physical resemblance and mental resemblance is found.

Individual Differences in the Speed of Serial Reaction of Large Muscle Groups. MALCOLM CAMPBELL, University of Oregon. (Introduced by R. H. Seashore.)

The production of an apparatus permitting serial reaction with equal ease from any major portion of the body preceded the comparison of four musculatures, the two arms and legs, as to speed of serial reaction. Fifty college sophomore men acted as observers.

Reliabilities for the tests ranged from $r_{\frac{1}{2}-\frac{1}{2}}=.93$ to .96. Intercorrelations ranged from $r=.84$ to $r=.96$. Comparison with a test for speed of serial reaction with the fingers gave an intercorrelation of .65. Correlations with intelligence test scores, ratings on training, endurance in gymnasium tests, height and weight were insignificant.

The presence of a general intermusculature determinant is indi-

cated by the results. A proposal is made concerning the general or specific nature of motor ability and some suggestion is included concerning the trend of future investigation in the light of present results.

The Bogey of the Personal Equation in Ratings. HERBERT A. CONRAD, Institute of Child Welfare, University of California. (Introduced by H. E. Jones.)

In an effort to minimize the "personal equation" in ratings of intelligence, the Army psychologists made adjustments on the basis of the normal curve. Calculation shows, however, that the adjusted ratings correlate no higher with the criterion of test scores than the unadjusted ratings.

This led the writer to an experiment in which the adjustments to the raw ratings could be made on a thoroughly empirical basis; and in which the disturbing effect of the personal equation was designed to approach a maximum. In this experiment, the mean (also median) personal equation between teachers in the same nursery school amounts to a lowering of correlation coefficients by only .013; the mean personal equation between teachers in different schools produces a lowering of correlation coefficients by only .022 (median .019).

The conclusion is therefore drawn that ratings are blemished by the personal equation to an extent far less than has been supposed. Attention is thus fortunately freed for concentration upon the elimination of other shortcomings in ratings. It may be hoped that when the rating technique has been as carefully studied and refined as the testing technique, results from ratings will be improved to the point of scientific, as well as clinical, value.

Further Results of Analysis of Expert Typing. J. E. COOVER, Stanford University.

I have already shown that sequences of strokes in typing may be divided into five finger techniques and that these require of the expert variable times in a range amounting to the ratio of 1:3. Correlation between experts was as high as .90, showing the laws to be general. I present here evidence that the same laws may hold for the amateur typist, when copy consists of either a familiar speed sentence, or new matter. A new analysis of the typing of another expert reveals the sway of the same laws; and also two individual differences which, when removed by intelligent drill, will increase her rate of typing 17 per cent. These individual differences are

magnified in a speed sentence which permits a rate of 170 words per minute. The data from this same phrase show the persistence of a high skill over a period of 15 years, during which no consistent drill was taken. The loss in skill was but 4 per cent. Finally, the times of carriage returns obtained from an expert who is equally practiced with left-hand and right-hand levers, show that the left-hand lever requires about 21 per cent more time in typing English than the right-hand lever.

The Influence of Letter-Position on Range of Apprehension. H. R. CROSLAND, University of Oregon.

One hundred twenty-five beginning psychology student subjects, in the range of attention experiment, where a gravity tachistoscope presents for 100 σ nonsense arrangements of 18-point, Caslon Bold capitals, in series of 4 through 9 letters per card, 10 cards per series, give results with a reliability coefficient of 0.7 or better. The results, when graphically depicted, reveal a descending effectiveness of letter-position from the left toward the right, regardless of shortness of exposure-series, regardless of the composite method of graphing, and regardless of the percentage frequencies with which the cards were reproduced without error. Faultless reproduction of cards occurred for only 52 per cent of the 4-letter series, 19.7 per cent of the 5's, 2.3 per cent of the 6's, 0.3 per cent of the 7's, 0.0 per cent of the 8's, and 0.0 per cent of the 9's. Graphs depict the foregoing percentage frequencies, the composite frequencies for letter-positions in Crosland's and Johnson's earlier work, composite letter-position frequencies in this work, the letter-position frequencies in detail for each series, and for the letter-position frequencies in cards containing only one or more errors (that is, in records from which faultlessly recalled cards have been excluded). There is a decided tendency in each series, and for the letter-position frequencies in cards containing only frequency than its immediately adjacent neighbor to the left. The longer the series the more does this tendency apply to the next to last and to the second from last characters from right to left on the exposure cards.

A Forward-Going Tendency in Maze Running. J. F. DASHIELL, University of North Carolina.

- (1) In a multiple-U maze white rats were found to run the true path more easily when the blinds were located always on the same side (C) than when they were located alternately right and left (A).

This phenomenon was examined by variations of mazes in several series of experiments. (2) When additional segments were added to the multiple-U mazes the animals manifested a tendency to run in the C manner regardless of which way they had been trained in the original maze. (3) When the C and A mazes were built on scales both smaller and larger, no alteration was found in the fact of easier running in the former. (4) Motion picture analyses brought out little if any evidence for any maintenance of gross orientation from turn to turn. (5) Simple mazes consisting of a straightaway, an elbow, and a T-choice with one alley running forward and one backward, when used with untrained rats brought out some indication of tendency to choose the former type of alley.

Different hypothetical explanations of the greater easiness of the C type maze are canvassed. It seems likely that the factor most responsible is a forward-going tendency in animal locomotion that lends not only maintenance for short distances of a direction already set but also to a compensatory sort of correction when forced out of line by an obstruction.

Imagery Differences and Their Functional Significance. F. C. DAVIS,
University of California. (Introduced by Warner Brown.)

The assumption is often made that auditory imagery plays an important rôle in musical accomplishment, that visual images function in the work of landscape and portrait painters, and that in the field of literature a preference for images of a given modality is discernible in the work of certain writers and in the judgments of critics. The present investigation was planned to show what differences, if any, can be found among university students in the kinds of imagery reported by them as functioning in particular test situations; and given such differences in the subjects' reports, to determine what significant differences, if any, obtain between the test scores of those reporting different processes. If such differences are found, with subjects of such relatively homogeneous background and intellectual capacity as state university sophomores and juniors, then some weight would seem to be added in support of the hypothesis that imagery differences are of functional importance in such highly specialized pursuits as the several arts seem to be. In this experiment significant differences are found, in certain of the tests designed to favor the use of a given kind of imagery, between the scores of those reporting that kind of imagery dominant and the scores of those reporting it weak or absent. The hypothesis that the tests tap different func-

tions rather than some general capacity like "immediate memory" is supported by the subjects' reports and by the relatively low inter-correlations of the various tests.

A Criticism of Unilateral Cerebral Dominance as an Explanation of Word Blindness. GRACE M. FERNALD, University of California at Los Angeles.

Criticism of Orton's theory from the point of view of brain function and from the experimental results with over 300 cases of word blindness and allied phenomena.

Meaning and Insight in Köhler's Psychology. S. C. FISHER, University of California at Los Angeles.

Naïve experience—the "layman's consciousness"—is by no means as replete with "why's" and "how's"—*i.e.*, *insights*—as Köhler maintains. Rather, these "insights" are present as reflections or after-thoughts when some situation elicits tendencies to interpret or communicate the meaning of experience. In support of this statement, we refer to certain by-products of a series of experiments in which observers were engaged in describing the experiences present in connection with accepting or rejecting novel presentations as members of a previously studied group. (*Psychological Monographs*, Vol. XXI, esp. pp. 175-179; *Amer. Jour. of Psychology*, XXVIII, esp. p. 98.) Observers reported the continuum of events; the perceived figures or features behaved in immediate experience as general or non-general, as belonging or not belonging to the group. Kinaesthetic or affective attitudes functioning as acceptance or rejection were often present. But the meanings or "insights" which in Köhler's view might have been expected—awareness, *e.g.*, that a feature was noted *because* it was general, etc.—were comparatively rare in the subject's experience, dominated as the latter was by a vigorous "determining tendency" to define or classify. When it did occur the "meaning" or "insight" was apparently a verbal label for a reflective set induced by a number of conditions. Among these conditions figured prominently such factors as need of social communication of the import or meaning of a given experience, theoretical interest or speculation on the observer's part as to the object of the experiments, or especially conspicuous accompanying contents. In the more mechanized procedures, observers never reported such "insights." It is possible that concern with the dynamical aspects of the physical *Gestalt* as hypothesized by Köhler would serve as a

condition tending to elicit reflective states which would be referred back as "insights" into the direct continuum of experience. But the assumption that "insight" is a characteristic and very common component of unreflective human experience seems unwarranted by any evidence on hand.

Experiments in Vision and Touch. SHEPARD I. FRANZ, University of California at Los Angeles.

Reports will be made of certain improvements in vision and touch accompanying training, and a discussion of the facts in relation to possible cerebral activities.

Experiments on Maximum and Minimum Action in the White Rat and Least Effort and Insight in Monkeys. J. A. GENGERELLI, University of California at Los Angeles.

A series of experiments was performed with blinded and normal white rats to determine the nature of the path which the animals would eventually select from an indefinite number of possible paths leading to food. It was found in practically all cases that the path finally chosen by the animals was the path of least distance.

A problem box was constructed and stylus mazes used for the purpose of investigating the tendencies of least effort and insight in monkeys.

Anticipations of Perception in Color-Mixture. KATE GORDON, University of California at Los Angeles.

British empirical psychologists had taught that we cannot frame in our minds a sensory element which has not come to us from sense, but Hume allowed a certain exception in that passage about the shades of blue, where he supposes that a man who had seen all but one in a series might perhaps imagine, from those on either side in the series, what it was like. Color discs, mounted on a wheel, were shown to a group of 103 persons. On each disc were two or more colors. The subjects were asked to try to imagine what these would look like when they were mixed by rotation. In order to have some way of recording their guesses as to the color, a chart of samples was presented and the subject designated the sample which he thought would match the resultant color. The wheel was then turned, and the subject looked at the mixed color and matched it to one of the samples on the chart. In this way the discrepancy between the guessed color and the perceived color could be described in terms of the number of

intervening color samples. The samples used were 100 shades of the Munsell series which vary by small steps from one end of the spectrum to the other, and are stated to be of equal saturation. Results show that when two colors near each other in the spectrum are mixed it is possible to guess closely, but that it is possible to find near complementaries which will make the guesses resemble mere chance.

A Comparison of the Learning Ability of Mus Norvegicus Albinus and Mus Norvegicus on Alley and Elevated Mazes of Identical Pattern. HARRY F. HARLOW, Stanford University. (Introduced by W. R. Miles.)

A comparison was made of the learning ability of domestic albino rats with the immediate descendants of wild brown rats on both alley and elevated mazes. The mazes themselves were identical in pattern, presented fifteen blind alleys, and had reliabilities (odd vs. even runs) of about .70. The correlation between the mazes for the albino rats was in the neighborhood of .70 and for the brown rats about .40. The albino rats were superior on both mazes by all three criteria chosen, time, errors, and trials. For both mazes the difference of the means divided by the probable error of the difference was about three for trials and errors and over ten for time. The alley maze proved to be the simpler of the two. The differences in the error scores, however, failed to prove significant for either group of rats, and trials were significant only for the albinos. Rating the brown rats for wildness by Yerkes' criteria and comparing the scores made by wild and tame members of this group with the average score made by the albinos, indicated that the differences shown by the two kinds of rats were caused by emotional traits and not learning ability.

The Belief in Attitudes. M. E. HERRIOTT, Los Angeles City Schools.

Attitudes are almost universally recognized as potent determining factors of behavior. Laymen, teachers, educationists, and psychologists may be quoted to this effect *ad infinitum*. Evidence of this recognition may readily be found in the daily press or one's daily contacts and in the writings of such educationists as Bagley, Bobbitt, Book, Briggs, Cameron, Clement, Colvin, Dewey, Inglis, Judd, Monroe, Ruediger, and Thorndike.

Despite the prominence of behavioristic and mechanistic psychologies, one need not enter into a lengthy discussion in order to establish

the fact that psychologists generally recognize attitudes. Even John B. Watson can be quoted in their support.

Dr. Ellen B. Sullivan has presented an outstandingly excellent summary of psychological investigations of attitudes.

Such psychologists as Titchener, Stout, Angell, Marbe, Mayer, Orth, Ach, Binet, Bühler, Müller-Freienfels, Grünbaum, and Pillsbury are quoted freely. I need not give specific citations here.

In 1922 a committee of the American Psychological Association under the chairmanship of Warren formulated four definitions of mental attitude.

Four years ago the writer undertook a study of attitudes as factors of scholastic success. In this investigation he attempted to get at the following factors: previous preparation, intelligence, reading ability, study habits, the ambitious-indifferent attitude, the cheerful-despondent attitude, the evaluative-nonevaluative attitude, the persevering-vacillating attitude, and the self-confident-dependent attitude. Certain conclusions were, of course, arrived at which may or may not be valid. Of first importance was the conclusion that the five major factors of scholastic success are: (1) previous preparation, (2) intelligence, (3) study habits, (4) evaluative-nonevaluative attitude, and (5) persevering-vacillating attitude, of which the last two, as judged by the size of tenth-order partial coefficients of correlation, are the most influential.

But more important than the direct outcome, it seems to the writer, were those incidental to the study. Three fundamental gaps in the science of education were made almost painfully evident. In the first place, there is no adequate knowledge or generally accepted theory as to the nature of attitudes and related traits or characteristics. In the second place, we do not have adequate measuring instruments for all aspects of mental life. So-called intelligence tests and educational tests serve reasonably well, but we do not have a firm foundation upon which to stand even in these fields. In the third place, we have no developed statistical techniques that are wholly adequate to our needs, nor have most researchers become fully aware of the uses and limitations of those techniques at present available.

Delayed Reaction in Rats. C. H. HONZIK, University of California.
(Introduced by E. C. Tolman.)

Rats were trained to choose the one door in three which contained a white curtain, and not to try the other two doors which contained black curtains. When this discrimination habit was firmly estab-

lished, the rats were allowed to run toward the white curtain but not to pass through. A screen which obscured all the curtains was immediately lowered, the rats were delayed for varying periods of time, and during the delay period a black curtain was substituted for the white. When the screen was raised the rat was confronted with three black curtains and he had to choose that door which had contained the white curtain, that door being the only correct one. Positive results were obtained.

The Galvanic Skin Reflex in Young Children. H. E. JONES, Institute of Child Welfare, University of California.

Galvanometric records were obtained from 54 preschool children, tested on two occasions by a standardized series of emotionally provocative stimuli. Results were analyzed in terms of: (a) average deflections for each stimulus; (b) average latent periods for each stimulus; (c) the effects of negative adaptation; (d) the reliability of galvanometric determinations, in terms of correlations of the first and second series; (e) the specificity of the galvanic skin reflex, in terms of intercorrelations of the deflections to the various stimuli; (f) the relationship of overt and implicit response; and (g) the validity of galvanometric data, as checked against other criteria of emotionality.

Some of the Functions Underlying the Responses of Monkeys to Stimuli in Different Sense Fields. HEINRICH KLÜVER, Institute for Juvenile Research, Chicago.

Groups of equivalent and nonequivalent stimuli were determined in various sense fields in a series of experiments conducted with Old World and New World monkeys (*cf.* H. Klüver, *The Equivalence of Stimuli in Monkeys*. Proceedings and Papers of the Ninth International Congress of Psychology, p. 263. The following facts seem to stand out:

(1) The properties of the stimulus objects may be changed radically without upsetting the response of the animal; *i.e.*, no matter how much the stimuli differ with respect to their properties the consistency in the reactions of the animal indicates that equivalent stimuli must be alike in terms of *one general characteristic*;

(2) Experimentally it is often found that this general characteristic is linked up with a definite property of the stimuli, *e.g.*, rhythm or relative size, a property which must be considered *crucial* so far as the reaction of the animal is concerned;

(3) Although the efficacy of some general characteristic must

be inferred from the consistency of the responses, it is not to be concluded that under nonexperimental conditions the animal reacts in terms of such general characteristics; it is merely demonstrated that the animal is able to fall back on such general characteristics. (Problem of *fragility* of functions);

(4) It is found that the same general characteristic is reacted to with greater ease in some stimulus situations than in others; although equivalent stimuli must be considered similar, there are *degrees of similarity* as indicated by the behavior of the animal (increase in number of successive trials, hesitation, etc.).

(5) The fact that very general characteristics may be primarily effective in determining the behavior of the animal under experimental conditions does not give us any information about the *genesis* of the responses, e.g., on the question whether they are native or acquired.

In formulating a *working hypothesis* concerning basic functions in primate behavior the following points must be emphasized:

(1) Psychologically viewed, the responses of the animals are not determined by the objective properties, but by the phenomenal properties of the stimuli;

(2) "Peripheral" physiology showing the dependence of certain physiological events on certain stimulus conditions cannot at present throw any light on the basic functions considered here since it does not furnish any precise information on the physiological correlates of phenomenal properties;

(3) Since very general characteristics are not only effective in determining the behavior of monkeys, apes, and men, but also of bees (M. Hertz) and rats (Lashley) it is assumed that animals of different species are adequately characterized from a psychological point of view only if the following points are taken into consideration: (a) the number of stimuli the animal can react to in terms of one general characteristic; (b) the ability of the animal to differentiate the stimuli belonging to groups of equivalent stimuli; (c) the "fragility" of the reactions of the animal; (d) the dependence of these reactions on the neural, physiological, etc., equipment of the animal.

A Comparison of Time, Errors, Distance, Excess Time, and Speed as Measures of Maze Learning. J. R. LIGGETT, University of California at Los Angeles.

The study represents a statistical comparison of time, errors, distance, excess time, and speed scores obtained from 25 rats in a

sectional maze. It was found that the maze measures two factors (1) the elimination of errors or excess distance, (2) increase in speed. Error scores or distance scores give a measure of the first of these factors. The second factor is best measured by speed scores. Time scores are not accurate, because they are influenced by errors. The two learning factors were found to be independent (except that they are concurrent).

The Language Development of the Preschool Child. DOROTHEA McCARTHY, California Bureau of Juvenile Research.

Fifty consecutive verbal responses were recorded for 140 children at each of seven year levels at six months intervals from 18 to 54 months. Paternal occupation was used as a criterion in order to secure a representative sampling of the population:

These data were subjected to four different types of analysis: (1) according to the length of response, (2) according to the complexity of sentence structure, (3) according to the function of the response based on a modification of Piaget's classification, and (4) a word analysis according to the various parts of speech. Each of these analyses was carried on in relation to age, sex, paternal occupation, mental age and age of associates.

The results yield tentative normative material on linguistic development during the preschool period. In addition to the developmental trends noted with increase in chronological age, there appeared small but consistent sex differences indicating earlier linguistic maturity among girls than among boys. These differences were found in all phases studied as were also significant differences between the upper and lower occupational groups, indicating clear superiority of the children of superior socio-economic status in language development.

(NOTE: This study has just been published by the University of Minnesota Press as Monograph No. 4 of the Institute of Child Welfare Monograph Series.)

Relearning in the White Rat. QUINN McNEMAR, Stanford University. (Introduced by C. P. Stone.)

The data presented come as a by-product of another major study, hence not a systematic study of relearning; yet the results are of value as indicating the factors which must be considered in studies of retention in the rat. Fourteen groups of rats were required to learn the Stone multiple-T maze, and then relearn under varying conditions as to laboratory experience, age, and retention interval.

The results indicate that age is a possible factor which might affect relearning or retention. Some indication is given to the effect that the forgetting curve may be curvilinear similar to the Ebbinghaus curve for humans. The correlations of learning with relearning indicate that the maze is consistent even over long intervals of time. Plans are being formulated for a thorough study of the factors affecting the retentivity of the white rat.

Auditory Fusion in the Vibrato. MILTON METFESSEL, University of Southern California.

The vibrato in artistic voices consists of a variation in frequency of vibration, cyclic in nature, with its extent on the scale averaging about a half-step, and ranging from a tenth to over a whole step. Its average artistic rate is almost seven cycles per second, ranging from five and a half to eight and a half. A vocal trill ranges from three-quarters to two full steps.

The auditory organization of the vibrato, however, is not the same as the physical organization. There is no change of pitch in the vibrato, and it was determined by the use of synthetic vibratos played from siren discs that the successive frequency cycles in the physical vibrato fuse into a single, steady pitch. The successive sound wave fusion also produces a new quality in the tone (sonance), and a pulsing.

This effect might be called "tone-mixing" inasmuch as there are two notes on the sound wave which fuse into one in auditory experience. Roughly, the pitch heard in a half-step vibrato is near to half-way between the two physical notes when graphed in terms of tenths of a musical step. Individual differences are apparent, suggesting that an artist may be sharpening for one auditor and flattening for another on the same note.

In the region near high C, the pitch heard drops slightly from the half-way point. A trill in this region a whole step in extent has two localizable pitches about a third of a step apart, the upper being slightly above the half-way point between the two physical notes (or extremes of the cycle).

Suggestion in Pictures. I. MISUMI AND P. R. FARNSWORTH, Stanford University.

Farnsworth and Beaumont¹ have previously demonstrated that it is possible to influence the preference ratings of pictures to a con-

¹ FARNSWORTH, P. R., and BEAUMONT, H. Suggestions in Pictures. *J. of General Psychol.*, 2, 2 and 3, 1929, 362-366.

siderable extent by means of attached and suitably composed descriptive paragraphs.

In the present study a survey was made of student familiarity with artists' names. The four best known and four least known names were then attached to certain pictures. Each picture was rated by two groups of students. One group supposed the picture to have been painted by a well known artist; the other group supposed it to have been the work of an unknown painter. Consistent alterations in the preference ratings resulted, indicating that considerable suggestion had been present.

Some Extensions of Psychological Measurement into Industrial Problems. HERBERT POPENOE, Stanford University.

Buying behavior of the public with regard to department stores, automobiles, transportation by railroad, phones, shoes, cosmetics, use of gas and electricity, newspapers, radio, and many other industrial situations are associated with mental "sets" of extreme definiteness and persistence. It is possible to measure the mental "set" of each individual of a group, and to determine statistically the relative contribution of each identified causal element involved.

This has been accomplished through the construction and use (in the form of interviews) of batteries of test items. These are developed in a manner very similar to that used in psychological and educational tests. The work has been carried on in more than thirty industrial concerns, involving more than 150,000 interviews.

In each study determinations have been made of: (1) the extensity of occurrence of each causal element; (2) the intensity of influence of each causal element; (3) the average level of the mental "set" of the group.

Analysis has shown that these "sets" are largely determined by the past experience of the individual, and in part by such factors as geographical location, social and economic status, occupation, sex, race, and age. It has been demonstrated that these "sets" have high reliability, are very amenable to statistical analysis, and are causative determiners of socio-economic behavior.

Studies in Mental Fatigue. A. S. RAUBENHEIMER and Students, University of Southern California.

The study was an attempt to verify the experimental findings of Arai and Thorndike in regard to the effect of continuous mental work (12 hours) on mental efficiency in specific functions.

Three subjects were involved in carrying on substantially the experiment of Arai. In addition, the influence of sustained mental work on certain other mental functions and on fundamental conditions of metabolism was studied.

The Effect of Inanition on Learning Behavior in the White Rat.
FLOYD L. RUCH, Stanford University.

At the age of 30 days three groups of rats, equated for sex and for body weight, were subjected to the following dietary conditions: a maintenance group composed of 28 rats was held at body weight by appropriate limitation of the food supply; an *ad libitum* group containing 23 animals was given unlimited opportunity to feed; and a retarded group of 28 was held to a rate of growth which was 80 per cent of that for the *ad libitum* animals.

At the age of 50 days the maze trials were started. The maze employed was a modification of the Stone Multiple-T Maze. The significant characteristic of the maze employed in this experiment was the fact that it was filled with water in such a fashion that the animal could escape only by swimming through it to the escape platform. The animals were fed prior to the first maze trial on a given day thus eliminating the factor of differential hunger motivation in the experimental groups. One maze trial per day for the first four days was given. Following this two trials were given each day until a total of 30 trials had been reached.

Performance of the animals was scored in the following manner: total time in seconds; Type I Errors or errors made when the animal going in a forward direction entered a blind alley; and Type II Errors which consisted of a segment of the maze retraced.

The Pearson coefficients of correlation based on forward errors made in odd numbered blind alleys vs. even numbered forward errors are as follows: maintenance, .67; *ad libitum*, .76; and retarded, .25. These coefficients have been corrected by the Spearman-Brown formula for halved data.

The differences between the mean performance of the groups are stated in terms of the Standard Errors of the differences.

CRITICAL RATIOS

Score	$M_m - M_s$	$M_s - M_r$	$M_m - M_r$
Time.....	0.68	1.18	1.70
I Errors	2.00	0.48	2.56
II Errors	0.92	1.64	2.48

In view of the low magnitude of these critical ratios, these results should be regarded as merely suggestive. In so far as the differences between the maintenance and *ad libitum* groups are significant, they tend to confirm the results of Anderson and Smith.

Further Studies in Rhythmic Auditory Motor Coordinations.

ROBERT HOLMES SEASHORE, University of Oregon.

Previous work at the University of Iowa indicated that temporal precision of the right hand in following a simple repeated rhythmic pattern by tapping a telegraph key is related to scores made on a sensory rhythm test (C. E. Seashore, Columbia phonograph record, "Sense of Rhythm"). This sensory rhythm test, which involves judgments of "same" or "different" on successive pairs of patterns, is in turn related to the number of trials necessary to learn a series of more complex sensory rhythm patterns.

The present study compares the scores made on the motor rhythm test with various patterns and with various musculatures in order to determine the validity of the procedure of testing one musculature on one pattern, as a possible test of aptitude for musical performance.

The Aptitude Hypothesis in Motor Skills. SIGFRID SEASHORE, University of Oregon. (Introduced by R. H. Seashore.)

The six tests of the Stanford Motor Skills unit were used on 50 operators of high speed winding machines, working under optimal industrial conditions in the Jantzen Knitting Mills. This afforded a critical test of the hypothesis of motor aptitudes as determinants of individual differences in complex practical motor skills. In spite of high reliabilities of both the motor tests and the criterion, measures of piece rate under normal working conditions, there was practically no correlation between the separate motor tests or the battery as a whole and the criterion.

A control experiment showed further that short samplings of several minutes work of maximum speed on the criterion performance are not indicative of the normal rate on the same performance. An additional study not yet completed attempts to discover by slow motion camera analysis whether the normally slow workers accomplish their "spurt" performances by different and more wasteful or more tiring methods than the normally fast workers.

The motor test scores of this group are further compared as to specificity of skills and reliability with results from a university group, a high school group, and a group of ten year old grade students (all male observers).

Utricular Discrimination. STEVENSON SMITH, University of Washington.

Local sign of a single retina is not a factor in discriminating which of the two eyes is stimulated. If such a discrimination is possible there must be diverse local sign of corresponding points on the two retinas. Capacity to make this discrimination was established by the use of an improved apparatus which afforded stimulation of either eye from various angles and of various intensities. In order to determine whether utricular local sign is a function of iris and ciliary movement, these muscles were relaxed by the use of homatropin and cocaine. With such relaxation utricular discrimination was still perfect. This points to the possibility that such discrimination is a function of the external eye muscles.

Observations on Wildness and Savageness in Rats of Mixed Strains.

(From the Institute for Juvenile Research, Chicago.) CALVIN P. STONE, Stanford University.

In this experiment the following strains were employed: trapped brown rats, first generation of wild stock reared in the laboratory, crosses between albinos and wild stock, crosses between albinos and half-breeds, yellow hooded animals, and albinos of the Wistar stock. Each group, excepting the trapped wild stock, consisted of from 20 to 40 individuals reared under similar conditions and without handling until the outset of the experiment or the age of four months.

In the first experiment each animal was rated for wildness and savageness on a 10 point scale for 10 consecutive days. The order of wildness and savageness of these groups was rated as follows: trapped wild adults, descendants of the wild stock reared in the laboratory, half-breeds, quarter-breeds and yellow hoods, and lastly the albinos of the Wistar stock. In experiment two, strength of the hiding response as balanced against hunger was tested daily for 10 days. The obtained rankings in this experiment were similar to those of the foregoing except that the quarter-breeds were slightly less prone to hide than the yellow hoods. Differences between descendants of the wild stock and half-breeds and likewise those between the half-breeds and pure albinos were statistically significant. In the early trials only were differences between the albinos and the quarter-breeds or the yellow hoods consistently significant. Experiment three consisted of maze learning. Despite a long period of taming, the adult wild animals with only a few exceptions refused to run the maze; also their descendants even after the taming involved in the

first and second experiment which lasted 20 days were too wild to run the maze. All other groups, however, had become sufficiently tame at the end of the second experiment to run the maze with only occasional evidence of timidity. No striking differences in time or error scores were obtained for these groups. Without systematic preliminary training, however, many of the half-breeds and a small per cent of the yellow hoods and quarter-breeds refused to run the maze. On the whole it is evident that the factor of wildness uncorrected by systematic taming is incongruous with meaningful tests of maze learning ability.

Preliminary Report of Activities of Mental Hygiene Clinic of Los Angeles County Department of Health. ELLEN B. SULLIVAN, University of California at Los Angeles.

Organization, types of cases handled, methods and procedures in this clinic, together with a discussion of certain experimental phases of the psychological work.

An Experimental Study in Control of the Vocal Vibrato. A. H. WAGNER, University of Southern California.

Vibrato in the voice has long been a subject of controversy among musicians. Tones of nine well-known operatic singers were selected as examples of satisfactory use of vibrato in both calm and agitated singing. These tones were reproduced through phonophotography and analyzed as to rate, extent and regularity of vibrato. Control tone phonophotographs were then taken of the voices of forty students with less desirable vibrato and a group having no vibrato and technique developed for the cure of these vocal shortcomings.

Conclusions reached:

- (1) That production of vibrato can be taught to preadolescent boys and adults of both sexes.
- (2) That refinements in rate and regularity can be made by "harnessing" the vibrato to rhythm.
- (3) That refinements in extent can be made by giving attention to the proper action of the abdominal musculature having to do with controlled expiration.

The Validity of Serial Motor Tests for Predicting Proficiency in Typewriting. ROBERT Y. WALKER, University of Oregon.
(Introduced by R. H. Seashore.)

Seventy first-semester typewriting students were tested on the six tests of the Stanford Motor Skills Unit to measure their proficiency

on a sampling of serial motor skills. After seven months training in typewriting the students were given the standard form of speed tests to measure their attained proficiency in typing. Two criteria were used to check against the scores made on motor tests: (1) the gross number of strokes made on the typing test, and (2) the "rate" of typing in words per minute after a heavy penalty of 51 strokes had been deducted for each error, following International Contest rules.

No significant relationship was found between either criterion and the composite score (equally weighted) of the motor tests although they averaged $r_{\frac{1}{2}-\frac{1}{2}}=.84 \pm .02$ for reliability. The only individual motor test which gave a significant correlation with typewriting was speed of tapping a telegraph key: with gross number of strokes $r=.28 \pm .09$; with "rate" $r=.62 \pm .06$. This is somewhat unusual because the reliability of "rate" was $r=.63 \pm .06$, while the reliability for gross strokes was $.89 \pm .01$. The reliability for errors was only $r=.28 \pm .06$.

Neuromuscular Development During the First Twelve Months of Life. LOTTA V. WOLFF, Institute of Child Welfare, University of California.

As a part of a developmental study at the Institute of Child Welfare, 60 normal full term infants have been examined monthly from birth to twelve months, with a cumulative record of the growth (or lapsing) of the following reflex functions: Moro, abdominal, Babinski, postural adjustment to head rotation, Landau, spinal, Brudzinsky, and responses to changed body position. A group of tests of other motor functions was also included. The report covers a description of the responses studied, the growth curves for each response, and tentative conclusions concerning the nature and course of neuromuscular development during infancy.

Handedness in Rats. JOSEPH G. YOSHIOKA, Institute for Juvenile Research, Chicago.

Two hundred rats were tested for handedness with a specially devised food-pan. Nine were ambidextrous; among the rest 96 were right handers, and 95 left handers. When the bones of fore limbs were cleaned and measured, it was found that the ambidextrous rats had equal right and left arms, but among 96 right handers 36 possessed right arms longer than the left, 60 having equal right and left arms. In no case had a right hander a right arm shorter than the left. Similarly 45 among 95 left handers had left arms

longer than the right, and 50 had equal right and left arms, but in no case had a left hander a left arm shorter than the right. It seems that a preferential use of one hand may have originated from a better development of that arm. This view is supported by the fact that the anatomical asymmetry was found more often among the young animals than among the old ones.

It is concluded that in a random sampling of laboratory rats a very few are likely to be ambidextrous, and the rest divide themselves about equally to right and left handers. A preferential use of one hand may have originated, in part at least, from a better development of that hand and arm.

PSYCHOLOGY IN 1929 AT THE INTERNATIONAL CONGRESS

BY KATHERINE ADAMS WILLIAMS
Radcliffe College

At the meeting of the Ninth International Congress of Psychology such a large number of papers were read that their classification affords a view of the interests and trends of modern psychology.

The *Proceedings* of the Congress¹ comprise 422 abstracts of papers, exclusive of those of which the title only is given. Because of the relatively large number of papers from this country, inferences to the state of psychology in the United States will be better founded than inferences to the state of psychology in any other country, all other countries, or the entire world. Table I shows the distribution of papers among the various countries.

The classification according to subject-matter, shown in Table II, indicates what topics are of most interest. The sub-heads of the classification are determined mainly by the demands of the material, but are also related to the schemes used by the Psychological Index and the Psychological Abstracts, and to the names of the symposia at which the papers were given at the Congress. Since many articles necessarily fall under two or more heads, there is a great deal of overlapping. The wide range of subjects makes it unprofitable to list the foreign contributions separately by country. *Tests and Measurements* is the general topic under which the largest number of papers fall, although *Applied Psychology* ranks first in number of foreign contributions. It is noteworthy that *Animal Psychology*, which ranks fifth so far as total number of papers is concerned, boasts only two foreign contributions, both of which are made by Russians and both of which deal with the subject of the conditioned reflex.

The classification according to method of treatment of the subject (Table III) shows the relative parts played by reflective analysis and by experiment and research. It also answers such questions as the following: Is there a tendency toward the use of objective

¹ *Proceedings of the Ninth International Congress of Psychology*, 1930.

methods of observation as compared with introspective methods? How large a part does observation in 'real life' situations play as compared with laboratory observations? The papers listed under *Traditional Method* are neither clearly objective nor strictly introspective. For instance, in the traditional type of laboratory experiment the subject is often not required to give any elaborate introspective account but is merely told to *do* something. The observations of the experimenter are perfectly objective but the behavior is usually, according to the instructions, a sign of a fact observable only introspectively. The class called *Traditional Method* includes cases in which the report or 'sign' was verbal; but where an analysis or description of the conscious state was essential to the experiment, the report falls in the class called *Introspective Method*. *Tests* do not fit any of these classes, for they bear quite as close a resemblance to the 'traditional' laboratory technique as to the objective method of investigation and they are given under conditions which are as much like situations of 'real life' as like laboratory conditions. They, also, therefore, constitute a class by themselves. Descriptions of apparatus which might be used for either objective or introspective results, and discussions of statistical procedure are omitted entirely from this classification. There is still, however, some overlapping.

The classification shown in Table IV casts light upon the relative predominance of the points of view of various systems. Does the main interest lie in facts of consciousness or in facts of behavior? If the latter, are the facts studied facts of gross behavior, or are they physiological facts? Here as in the preceding table there is a special class for those studies in which the interest was in the correlations between stimulus and conscious response but not in analysis of the conscious state *per se* and not in objectively observable behavior. Two other classes of report are almost invariably ambiguous. In the first place, studies of maladjustment and of pathological abnormality very often take their departure from observations of abnormality in behavior but interpret this behavioral abnormality as a manifestation of a disturbance in consciousness. Again, mental tests may be of interest as tests of conscious process or as tests of behavior. Finally, there are a great many reports which give no clue to the nature of the interest. Here, as in the preceding classificatory scheme, descriptions of apparatus, and discussions of statistical technique which might be used in the service of either sort of interest, are not included.

Table V supplements Table IV. It classifies the rather small number of papers which explicitly support any definite position with respect to psychological systems.

Tables IV and V do not give an entirely satisfactory picture of the trend of psychology in its theoretical and systematic aspects, even as they were exhibited at the Congress. The most serious distortion occurs in the case of *Gestalt* psychology. There is, to be sure, only one report (by Köhler) which is explicitly of that school. Even this one is not polemical. There are, however, numerous references to the school. There are also, no doubt, a considerable number of problems undertaken under its influence, but, since the writers of the abstracts make no such admissions, the number cannot even be estimated. Psychoanalysis is in a similar case. It is mentioned and discussed, more or less, and its method was undoubtedly used in some of the researches reported, but any precise determination of the number is impossible.

TABLE I
DISTRIBUTION OF PAPERS BY COUNTRIES

U. S. A.	321	Switzerland	2
Germany	26	China	1
Great Britain	17	Denmark	1
U. S. S. R.	13	France	1
Canada	6	Hungary	1
Holland	5	Japan	1
India	5	Lithuania	1
Italy	5	New Zealand	1
Austria	4	Norway	1
Belgium	3	Palestine	1
Argentina	2	Poland	1
Spain	2	Sweden	1

TABLE II
DISTRIBUTION OF PAPERS ACCORDING TO SUBJECT-MATTER

		U. S.	All other countries	Total
Tests and measurements.....	.....	81	9	90
General and theoretical considerations (significance and utility of tests, technique and statistical procedure) .....	.....	22	3	25
Intelligence tests ² .....	.....	18	4	22
The nature of <i>g</i>.....	.....	14	2	16

² In six of these the intelligence test is incidental to the main investigation.

TABLE II (Continued)

	U. S.	All other countries	Total
Tests of growth and development.....	9	..	9
Tests of character traits and of personality	7	..	7
Measurement of "higher processes".....	6	..	6
Measurement of emotion.....	3	..	3
Measurement of "interests".....	2	..	2
Applied psychology	60	12	72
Clinical psychology, psychiatry, and medical psychology	23	5	28
Educational psychology	16	1	17
Legal psychology	13	2	15
Psychology in industry.....	8	4	12
Child psychology	36	9	45
Adjustment problems	10	1	11
Development	8	..	8
Reflexes	25	8	33
Conditioned reflexes	9	5	14
Psychogalvanic reflex	7	3	10
Other reflexes and general and theoretical considerations	9	..	9
Animal psychology	29	2	31
Problems of learning.....	13	..	13
Instinct or innate behavior <i>vs.</i> learning or environmental influence	7	..	7
Conditioned reflexes	2	2	4
Systems and fields of psychology.....	16	9	25
Memory ⁸ (learning, association, and habit)....	20	4	24
Emotion	12	11	23
Personality	19	3	22
Types	3	1	4
Character	5	..	5
Traits	4	..	4
Aesthetics	17	5	22
Theory of aesthetic feeling, etc.....	10	3	13
Applied aesthetics	7	2	9
Music	6	2	8
Physiological psychology	16	3	19
Motor activities and skills.....	13	2	15
Eye-movements	5	1	6
Statistics	15	1	16
General discussions	3	..	3
New formulæ, etc.	12	1	13

⁸ This includes work on human beings only.

TABLE II (Continued)

	U. S.	All other countries	Total
Abnormal psychology exclusive of psychopathology	8	7	15
Hallucinations	2	2	4
Hypnosis	2	..	2
Suggestion	1	..	1
Instinct	11	3	14
Apparatus	12	1	13
Meaning	8	3	11
"Higher processes"	7	4	11
Perception	5	5	10
Sleep	10	..	10
Social psychology	6	3	9
Sensory capacities	5	3	8
Race	4	4	8
Motivation and interests	7	..	7
Psychophysics	4	3	7
Drugs	5	1	6
Religion	5	1	6
Speech	3	2	5
Philosophical subjects	2	3	5
Historical subjects	3	1	4
Dreams	1	1	2
Images	1	..	1
Eidetic images	1	..	1

TABLE III
DISTRIBUTION OF PAPERS ACCORDING TO TREATMENT OF SUBJECT

	U. S.	Ger- many	Great Brit- ain	U.S.S.R.	All others	Total for- ign	Total
Analysis	121	15	15	3	18	51	172
Theoretical, philosophical, and historical	22	5	3	..	5	13	35
Specific topics	72	9	9	3	13	34	106
Problems and methods	27	1	3	..	..	4	31
Experiment	118	6	2	10	11	29	147
Objective method	94	5	..	8	5	18	112
Traditional method	14	1	1	2	4	8	22
Introspective method	10	..	1	..	2	3	13
Real life observations	31	4	..	2	9	15	46
Tests	20	1	..	1	1	3	23
Combination of test and real life observation	23	..	1	..	..	1	24
Unclassifiable	2	..	..	..	..	..	2

TABLE IV

DISTRIBUTION OF PAPERS ACCORDING TO SYSTEMATIC POINT OF VIEW

	U. S.	Ger- many	Great Brit- ain	All U.S.S.R. others	Total for- ign	Total	
Prime interest in							
Gross behavior	136	4	1	10	5	20	156
Physiological facts ⁴	19	1	1	1	2	5	24
Behavior with interpreta- tion in terms of con- sciousness	22	1	2	1	3	7	29
Correlation of stimulus and conscious response..	20	3	1	..	3	7	27
Mental tests	43	1	1	1	3	6	49
Facts of consciousness....	37	13	8	..	20	41	78
Unclassifiable	21	3	2	..	1	6	27

TABLE V

	U. S.	Ger- many	Great Brit- ain	All U.S.S.R. others	Total for- ign	Total	
Polemical or explicit ad- vocacy of							
Behaviorism or objecti- vism	7	..	1	..	..	1	8
Mentalism .....	..	2	..	..	..	2	2
<i>Gestalt</i> psychology .....	..	1	..	..	..	..	1
Dynamic psychology	1	..	..	..	..	..	1
Motor psychology	1	..	..	..	..	..	1
Act psychology	1	..	..	..	..	..	1
Psychical dynamism .....	..	..	..	..	1	1	1
Eclectic positions	7	..	1	..	3	4	11

⁴ In eight of the papers in this class the interest was in the effect of some physiological condition on gross behavior. All of these were contributed by Americans. In the rest of the papers in this class, the interest was in the physiological process itself.

SPECIAL REVIEWS

D. W. PRALL. *Aesthetic Judgment*. New York: Thomas Y. Crowell Company, 1929. Pp. xvi+378.

Dr. Prall's book is a most readable, thorough and highly discriminating treatise on what Clive Bell calls *significant form*, and which Dr. Prall terms surface qualities of experience, which constitute for him the substance of beauty when viewed with discrimination.

"Discriminating perception focussed upon an object as it appears directly to sense, without ulterior interest to direct that perception inward to an understanding of the actual forces or underlying structure giving rise to this appearance, or forward to the purposes to which the object may be turned or the events its presence and movement may presage, or outward to its relations in the general structure and the moving flux—such free attentive activity may fairly be said to mark the situation in which beauty is felt" (p. 57). The aesthetic judgment is a record, a pronouncement, of the occurrence of such free, direct, spontaneous, intuitive, intrinsic, pure, nonpractical activity. The aesthetic activity begins "where mechanics and physics and biology, economics and politics and ethics, end, where most of what we know of life is perfected into habits or even cessation" (p. 3). It is always present, however, as the background and substratum of practical experience and in those off-moments when we are delivered from the pressure of practical demands; "when the pressing occupations of practical effort either tire us or leave us for a moment to our own devices, as when in the absorbing business of driving at forty or fifty miles an hour along a highway to get to a destination, the tourist on his holiday glances at the trees or the hills or the ocean, or when, in sheer exhaustion, from a desk covered with letters to answer, or accounts to disentangle or invoices or contracts to check over, we look away and instead of turning to the clock to see when we must stop to meet an appointment, or when we may stop without prejudice to our wages, we turn instead, perhaps only for a moment, to the commotion about us, listen to the vast city noises roaring outside, notice the worried look of a face bent over another desk, the odd self-confident tone of a voice giving instructions, the monotonous repetition in the cadence of the telephone operator's answers and calls, the expertness of her manipulation of

the switch-board, the rattle of the typewriters, the banging of the surface-cars, the smoky shafts of light striking through dull windowpanes, the enveloping odor like hot glue that comes from the packing-house nearer the river, or even the image of the opaque river itself, swirling in oily patches under the bridge past the embankment" (pp. 31, 32).

Beauty is therefore coextensive with the whole realm of human experience and not limited to the sphere of art. Its sole demand is discriminating senses which can select "specific features of the world which thus become distinctly characterized objects in perception. Such selection and the further discrimination of details in these chosen formal objects are the sole avenues to aesthetic pleasure. And this means that without discriminating senses, and without cultivation of these senses, one remains in elementary and primitive ignorance of the world as it is actually presented to us to dwell in and to dwell upon" (p. 37).

Dr. Prall justly calls attention to the difference between the aesthetic judgment and the aesthetic experience. "Aesthetic judgment is distinguished from aesthetic experience as such by the simple fact that it follows and records such experience after the experience has been had, and in reference to what was experienced" (p. 51). Nor is aesthetic judgment, criticism. Aesthetic judgment "makes no attempt at first to say that one thing is better than another, nor to explain on what grounds it is so, nor to say just what class of things it belongs to, nor to explain it in any sense, nor yet to reproduce in an account of the thing some of its quality of beauty so that a reader of the criticism may reënact a similar aesthetic moment of more or less derivative appreciation" (p. 5). In other words, it is not dogmatic, dictatorial, nor descriptive. It is simply a report, a record, of a vital experience. Dr. Prall's book is limited to a study of the nature and the basis of this judgment, and he thus happily avoids the confusion and the muddled thinking that is found in too many books on aesthetics.

Dr. Prall has made in this book a most welcome and valuable contribution to the literature of aesthetics, written by a penetrating, clear thinker, and a fascinating stylist. He neither attacks other theories nor does he anywhere imply that his own is impregnable, a virtue but too rare in writings on this complex subject.

MAX SCHOEN.

Carnegie Institute of Technology

W. B. PILLSBURY. *The History of Psychology.* N. Y.: Norton, 1929. Pp. 326.

This very well written history places before the reader the principal "schools" and systematic positions that have appeared in psychological thinking since the time of the early Greeks until today. The treatment consists largely of dealing with certain selected men with a statement of their psychological positions (and a brief biological statement) and the development of each systematic position in the continuum of psychological thought. These statements of systematic position are excellently abstracted with all of the primary aspects given and with just enough detail to explain each system. The very early systems are dismissed with a few pages. Almost half of the book is given to a discussion of the empirical systems from Descartes to the beginning of the experimental period. The rest of the volume is concerned with post-experimental systems. This relative emphasis is so different from that in histories of psychology in the past that it cannot be called too clearly to the attention of the reader. In the past most histories have stopped just short of the experimental period and have dismissed these systems, in which most of us are so primarily interested, in a chapter or less. It is this relative emphasis of the later work and the clear and concise form of exposition which highly recommends the book to the student who attempts his first orientation to the historical background and development of psychological systems.

S. W. FERNBERGER.

University of Pennsylvania

CARL MURCHISON (Editor). *The Psychological Register.* Worcester: Clark University Press, 1929. Pp. ix+580.

The volume contains the personal and scientific data of some 1,300 psychologists from all over the world. For each is given a short *vita* and this is followed by the list of his psychological publications. Slightly more than half the volume is concerned with American psychologists. The rest of the volume contains the material for individuals in the British Empire, Austria, Belgium, China, Czechoslovakia, Denmark, Finland, France, Germany, Holland, Hungary, Italy, Japan, Norway, Poland, South America, Spain and Portugal, Sweden, Switzerland, and the Union of Socialistic Soviet Republics. The work has been excellently done and the reviewer has found only one serious omission in the name of Höffding. This work, which

was excellently conceived and remarkably well carried out, should be of great value to professional psychologists both for the purpose of obtaining data for foreign psychologists (there is no reference book outside of America which corresponds to the American Men of Science) and especially for bibliographical purposes.

SAMUEL W. FERNBERGER.

University of Pennsylvania

W. S. FOSTER and M. A. TINKER. *Experiments in Psychology*. Revised Edition. New York: Holt and Co., 1929. Pp. xv+392.

This is a thorough revision by Professor Tinker of the University of Minnesota of the former edition by Foster, which was published in 1923. Individual experiments are rewritten, some new ones added, and several dropped. The statistical treatment is revised, although the same topics are taken up.

The book is an outgrowth of the Introductory Laboratory Course given by Professor Tinker at Minnesota, and consequently is composed of experiments suitable for large classes, where considerable duplication of expensive apparatus is out of the question. It is very suitable for use anywhere, and contains enough experiments so that an instructor may choose those he wishes or modify to suit individual requirements.

The experiments dropped from Foster's original list are: Weber's Law, Taste and Smell, Filled and Empty Time, and Reflex Organic Responses—the first three as probably antiquated, and the last because it calls for too complicated apparatus. New ones added are: Two on Visual Phenomena, Span of Visual Apprehension, Individual Differences (in simple mental traits), Card Sorting, The Learning Curve, (Demonstration of) Animal Learning, Rational Learning, Eye Movements in Reading, Seashore Music Test, Affective Value of Colors, and Art Talent.

The reviewer feels that a course in Experimental Psychology should attempt to cover all possible fields of Psychology, with a few typical experiments in each given, in order to give students a well rounded sampling. The fields covered in this manual are: Sensation, 8 experiments, one cutaneous and the rest vision; Learning, 6; Experimental Aesthetics, 5; Simple Motor, 3; Pencil and Paper Tests, 2; Mentalistic, 2; Higher Processes, 1; and 5 miscellaneous, including Free and Diagnostic Association, Judgments of Intelligence and Emotion from Photographs, and Eye Movements in Reading.

(The classification is the reviewer's.) The list seems well rounded with the possible exception of the inclusion of too many of the typical structuralistic type, particularly those on sensation and imagery. Learning is very well treated, however, and the experiments in this group are well distributed over the field.

The statistical treatment is minimal, and the manual contains in the appendix numerous tables to facilitate calculation. Techniques are introduced along with experiments which demand them, rather than being grouped in a body. The reviewer thinks that a rather serious mistake was made in the effort to simplify the notation. The notation as used in Kelley's and Garrett's texts is accepted almost universally, and any divergence means that a student continuing in the field will have to unlearn and learn anew later.

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R. R. GATES. *Heredity in Man*. (Rev. Ed.) New York: Macmillan, 1929. Pp. xiii+385.

Mr. Gates is without possibility of doubt a most indefatigable *Sammelreferent*. In this single volume of modest size he appears to have collected most of the standard data bearing on his subject, as well as not a little bearing on general genetics. That some of the material most important to the psychologist is conspicuous by its absence, and that much of that which finds place is rather unevenly digested, is perhaps not surprising. The style suffers somewhat by comparison with works both higher and lower in the scale of popularization—with books like Crew's and Morgan's, as well as with ones like Whitney's *Basis of Breeding*. The use of the masculine personal pronoun in referring to Downey's work on handedness and the parenthetical note placing Long Island in Connecticut, while trifling in themselves, are perhaps diagnostic of the difficulty—one's viewpoint must be encyclopedic and one's capacity for inspiration unlimited to see a field like this fruitfully, and Mr. Gates, though a fine thoroughgoing pedestrian, will never be an aviator.

There are two or three things the psychologist looks for—if he looks for anything at all—when the publisher shoves another genetics book at him. What, in the first place, has been done that might throw any light on the untangling of multiple-factor situations? Nor is it necessary to hold the discussion down to intelligence as a material, or even stature; it happens that at the present moment one

of the most significant studies bearing on the inheritance of intelligence is that by Gowan on milk and butter fat production. Second, what is the latest story on linkage, including the sub-problems of correlated traits and racial differences? Third, what of the perennial battle between Freud and Mendel? It must be admitted that the picking in the volume under consideration is pretty poor; most of the book is taken up with more or less rare morphological recessives, mono- or digenic. There is no mention of the masterly analysis that made Fisher's earlier papers the high water mark in the biometric analysis of Mendelian heredity; in fact, there is very little of the biometric approach whatever. The provocative paper by Wilson on assortative mating is missing (assortative mating being represented only by passing allusions anyway) and the significant analyses by Burks, Merriman, etc., of heredity in mental characters are nowhere to be seen. We are concerned mostly with curiosities reminiscent of Havelock Ellis—polydactyly, baldness, osteopsathyrosis, polymastia, anodontia, choroideremia, albinism, etc., etc. The author is pretty up-to-date and common-sense about all this; for instance, we note for the first time a critical point of view on the inheritance of eye color, wherein it is remarked that actual as distinct from arm-chair eyes are being found to have all variations of color; it is, of course, pleasant to have the obvious officially recognized in this way, but it cannot be said to get us very far in the study of fundamental problems.

On the multiple-factor situation we have, besides numerous speculations as to the number of factors which may be involved in sundry peculiarities, a rather nicely written chapter on the inheritance of stature, commendably stressing the technique of correlating subdivisions of a general trait with each other as a test of general growth factors versus single factors for each component; this may be considered in connection with the remarks on Spearman's g (Kellley's addition unnoticed), which, however, appears in another part of the book.

The linkage matter is mentioned now and again, as in the section on eye and hair color; passing references are made to it in the course of the discussion on race crossing. The whole affair seems rather lame (with the single exception of sex linkage); but to be sure, the state of knowledge is itself not as yet very robust. No discussion of the possibilities of correlational analysis is to be found here, which seems like muffing a good chance.

In Freudian fields the author possesses some sophistication, but not much information. His section on asthma, under allergic diseases, is innocent of any hint that this affliction is often familial on a hysterical basis. In discussing dipsomania he submits without adverse criticism the hypothesis that while males are affected, females may be carriers. In fact, in all matters with which the psychologist deals directly his stand is relatively uninformed; neither the section on handedness nor that on intelligence bears any reference to the work of Travis on action currents; under musical ability he accepts Seashore's results without mentioning that they were obtained with an unreliable instrument; his analyses of mental disturbance are classificatory rather than functional; he thinks of feeble-mindedness as a condition of arrested development, and suggests a positive correlation between intelligence and insanity; in spite of admitting that feeble-mindedness is well known to be continuous, he is more than slightly inclined to think of it as monogenic; he feels that handwriting is an excellent index of character. There is, however, a refreshing return to the critical outlook in the kindly remark that although Davenport's analyses of temperaments are obviously inadequate they show courage in attempting to explore a difficult field.

There is certainly a place for a volume which will gather up the *significant* data on human heredity, digest them thoroughly, and present them with firm, bold strokes on the canvas of evolution; but it should be the work of a creative genius, and however admirable Mr. Gates' intentions and industry, there is little of the creator about him. For all that, the work may easily fill a need quite satisfactorily, given a specialized audience of modest capacities and ambitions.

RAYMOND R. WILLOUGHBY.

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DESCOEUDRES, ALICE. *The Education of Mentally Defective Children*. Psychological Observations and Practical Suggestions. (Translated from the second French edition by Ernest F. Roy.) Boston: D. C. Heath & Co. (no date). Pp. 313.

This is an English translation from the French book by Descoedres, who is an authority on the training of mentally defective children, and who has had wide experience in this work in Switzerland and Belgium. In Belgium she worked with Dr. Decroly and his influence is apparent throughout the book. The now well-known Decroly method of education was begun as a method of

instruction for mentally defective children and later on extended to the education of normal and superior children. The author of this book has borrowed much of the Decroly procedure; she has rejected parts of it, and modified others. In particular she has made much use of the numerous and ingenious Decroly games for teaching purposes, elaborating some and adding others of her own. Separate chapters of the book are devoted to such topics as Training the Senses, Physical Training, Hand Work, Drawing, Speech, Reading, Arithmetic, Spelling and so on. These chapters are full of practical suggestions and concrete illustrations of the responses of mentally defective children by one who has long been teaching them. Every teacher of special classes in this country would certainly come across valuable suggestions for class-room work in these pages, regardless of whether she may or may not agree with every method advocated by the author.

The author discusses briefly the history of special classes and the general examination before the transfer of a child to a special class. This examination should be pedagogical, psychological and medical. The pedagogical should consist of measures of educational attainment, the psychological of the Binet-Simon tests, and the medical of a thorough physical examination. Special classes in ordinary schools are considered a make-shift until special schools can be organized, because in the special school more homogeneous classes may be arranged. The special class has justified itself from a social standpoint because of the fact that one follow-up study of 2,258 special class pupils showed that 58 per cent of the boys and 60 per cent of the girls were found capable of earning their entire living, and 29 per cent of the boys and 28 per cent of the girls were capable of partially earning their living.

The author is to be congratulated on her interesting book and the translator on his admirable translation into English.

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BOOKS RECEIVED

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KURT LEWIN, *Die Entwicklung der experimentellen Willenspsychologie und die Psychotherapie*. Leipzig: Hirzel, 1929. Pp. 28.

DAVID A. OREBAUGH, *Crime, Degeneracy and Immigration. Their Interrelations and Interactions*. Boston: Badger, 1929. Pp. xvi+272.

A Study of Problem Boys and Their Brothers by the Sub-Commission on Causes and Effects of Crime. Albany: Crime Commission of New York State, 1929. Pp. 408.

RÉNE GUYON, *Réflexions sur la tolérance*. Paris: Alcan, 1930. Pp. 113.

K. S. LASHLEY, *Brain Mechanisms and Intelligence. A Quantitative Study of Injuries to the Brain*. Chicago: Univ. of Chicago Press, 1929. Pp. xiv+186.

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HILDEGARD HETZER, *Kindheit und Armut. Psychologische Methoden in Armutsforschung und Armutsbekämpfung*. Leipzig: Hirzel, 1929. Pp. xii+314.

FRITZ KÜNKEL, *Vitale Dialektik. Theoretische Grundlagen der individualpsychologischen Charakterkunde*. Leipzig: Hirzel, 1929. Pp. viii+134.

HAROLD H. G. HOLCK, *Diet and Efficiency. A Five-Year Controlled Experiment on Man*. Chicago: Univ. of Chicago Press, 1929. Pp. ix+72.

ROBERT M. YERKES and ADA W. YERKES, *The Great Apes. A Study of Anthropoid Life*. New Haven: Yale Univ. Press, 1929. Pp. xix+652.

HARRY CHAPLIN, *Gianfrancesco Pico della Mirandola On the Imagination*. The Latin Text with an Introduction, an English Translation and Notes. New Haven: Yale Univ. Press, 1930. Pp. ix+102.

A. J. I. KRAUS, *Sick Society*. Chicago: Univ. of Chicago Press, 1929. Pp. x+206.

FRANK C. SHARP, *Ethics*. N. Y.: Century, 1928. Pp. vi+566.

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E. R. HAMILTON, *The Art of Interrogation. Studies in the Principles of Mental Tests and Examinations*. (Introduction by C. Spearman.) N. Y.: Harcourt, Brace, 1929. Pp. xii+174.

HENRI PIÉRON, *Le développement mental et l'intelligence*. Paris: Alcan, 1929. Pp. xii+95.

STANLEY P. DAVIES, *Social Control of the Mentally Deficient*. N. Y.: Crowell, 1930. Pp. xix+389.

BENNO KERN, *Wirkungsformen der Uebung. Beitrag zur Psychologie der Arbeit*. Münster: Helios-Verlag, 1930. Pp. ix+508 (with 3 plates).

PAUL H. FURFEY, *The Growing Boy*. N. Y.: Macmillan, 1930. Pp. viii+192.

Survey of College Entrance Credits and College Courses in Music. N. Y.: Nat. Bur. Advancement of Music, 1930. Pp. vii+209.

MAURICE GARCON and JEAN VINCHON, *The Devil. An Historical Critical and Medical Survey*. (Trans. by S. H. Guest.) N. Y.: Dutton, 1930. Pp. 288.

ALFRED ADLER, *Problems of Neurosis*. (Preface by F. G. Crookshank.) N. Y.: Cosmopolitan Book Corp., 1930. Pp. v+244.

DONALD A. LAIRD and CHARLES G. MULLER, *Sleep. Why We Need It and How to Get It*. N. Y.: John Day, 1930. Pp. x+214.

CARL N. REXROAD, *General Psychology*. N. Y.: Macmillan, 1929. Pp. xv+392.

WALTER S. MONROE, JAMES C. DEVoss and GEORGE W. REAGAN, *Educational Psychology*. N. Y.: Doubleday, Doran, 1930. Pp. xiii+607.

LOUIS GRUDIN, *A Primer of Aesthetics. Logical Approaches to a Philosophy of Art*. N. Y.: Civici, Friede, 1930. Pp. xvi+247.

W. TROTTER, *Instincts of the Herd in Peace and War*. N. Y.: Macmillan, 1930. Pp. 264.

R. MONEY-KYRLE, *The Meaning of Sacrifice*. London: Hogarth, 1930. Pp. 273.

FRANK K. NOTCH, *King Mob. A Study of the Present Day Mind*. N. Y.: Harcourt, Brace, 1930. Pp. 226.

NOTES AND NEWS

DR. KIMBALL YOUNG, formerly associate professor of sociology in the University of Wisconsin, has been made a full professor in that university.

DR. W. V. BINGHAM, Director of the Personnel Research Federation, has been appointed lecturer in psychology at the Stevens Institute of Technology.

THE First International Congress of Religious Psychology will be held in Vienna from May 26 to May 31, 1931. For further information about programs, etc., address Professor Karl Beth, Vienna, Vii. Litterhofergasse 8, Austria, enclosing 50 cents in stamps.

DR. OSCAR EDWARD HERTZBERG, formerly professor of educational psychology in the Colorado State Teachers College at Greeley, has accepted a position as head of the new department of educational psychology at the New York State Teachers College at Buffalo.

DR. CHARLES SCOTT BERRY, professor of educational psychology at the University of Michigan and consultant in special education for the Detroit public schools, has been appointed to the staff of the State Department of Education of Ohio in the newly created office of consultant in the education of the mentally handicapped.

DR. CHARLES H. JUDD of the University of Chicago has been appointed to the Charles F. Grey Distinguished Service Professorship at that university.

DR. MARTIN L. REYMERT, formerly head of the Department of Psychology at Wittenberg College, has been appointed Director of Child Research at the laboratory now being established at Mooseheart, Illinois.

FOR A CHANGE IN THE DATE OF THE ANNUAL MEETINGS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

The question of holding the annual meetings of the American Psychological Association in September instead of during the Christmas vacation will doubtless be raised at the next annual business meeting of the Association. The desirability of this change in date became apparent at the Yale meeting of the International Congress. It is probable that had there been an annual business meeting of the Association last year and had the change then been proposed it would, with the memories of the Yale meeting fresh in mind, have been favorably received. Since, however, tradition is strong and the memory of the seasonal advantages enjoyed by the Yale meetings is apt to be fleeting, the proposal may now be opposed. It is with the effect of tradition and inertia in mind that I venture to recall the Yale Congress and to list some of the advantages of September over December.

(1) *Travel.* Traveling conditions are better in September than in December. Not only will those traveling by automobile be benefited by the change in date, but those traveling by train will also find conditions more comfortable and pleasant. Cold and drafty, or hot and stuffy, trains are not the rule in September as they are in December.

(2) *Accommodations.* If the meetings are held in September before the opening of the fall term, most of the universities at which we may meet will open their dormitories to us. This will make not only for a material reduction in expense but, as recent experience has shown, for successful meetings. Where the membership has been housed under one roof and has not been diluted with non-psychological guests, there have been held our most pleasant and profitable gatherings.

(3) *Weather conditions.* Weather conditions as a rule are much more favorable in September than in December. Not only will the formal meetings be held under more comfortable circumstances, since heating and ventilation are not problems in September, but the informal meetings, which are perhaps the most delightful at the annual conventions, may be held out-of-doors instead of in overheated and smoke-laden rooms. Between programs the members will also be able to enjoy walks and tours of inspection around the campus of the host-university.

(4) *Health.* If the annual meetings are held in September fewer members will return home ill, not only because of the more favorable

traveling, housing, and meeting conditions mentioned above, but also because pandemics—colds, influenza, and grippe—are not so prevalent then.

(5) *Section I of the A.A.A.S.* If the meetings of the American Psychological Association are held at times different from those of the A.A.A.S., Section I will be permitted to develop freely and naturally. Under present conditions—alternately rival and joint meetings of the two Associations—Section I plays a minor rôle in the development of psychology. When separate meetings are held Section I has a small attendance and its programs are not up to the standard of the other Sections of the A.A.A.S.; and when joint meetings are held, Section I does not function. The present situation is not conducive to the development of Section I.

Pressure for place upon the annual programs of the American Psychological Association is sufficiently great—as the annual reports of the past few years attest—so that two national meetings of psychologists could profitably be held every year.

(6) *Family.* If there is one time during the year more than any other when a member wishes to be with his family that time is during the Christmas holidays. Yet the annual meetings of the Psychological Association now afford the only opportunity for the renewal of professional acquaintances. The September date would resolve this unfortunate conflict.

(7) *Graduate students.* A minor point, but one which is significant if the "Graduate Students" section is to be what its name implies and not a section for instructors, is that the September date of meeting permits a student who is not yet an instructor to report upon a completed piece of work. In December the studies of graduate students are usually in the making; those having completed studies are almost invariably instructors with the doctorate.

One argument against the September date of meetings—whose cogency I do not admit—is that the summer vacations, particularly of those journeying to Europe, will be cut short. Those spending their vacations in this country will, I believe, find the September meeting a continuation of their holiday and a fitting close to it. The benefits and suggestions obtained from the meetings could be put into immediate practice, when the fall work is initiated and undertaken. Those spending their vacations in Europe might have to forego the meetings for that year, but they would have the meetings of Section I at Christmas time before them. In any case the numbers affected in any given year would not be great.

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